SUPERFUND RESPONSE ACTION PRIORITY PANEL REVIEW FORM

Date Form Completed: February 24, 2012

General Site Information

Region:	4	City:	Aberdeen	State:	NC
CERCLIS EPA ID:	NCN 000 407 447		CERCLIS Site Name:	Aberdeen Contaminated Groundwater Site (ACGS)	
NPL Status: (P/F/D)	F		Year Listed to NPL:	2008	

Brief Site Description: *(Site Type, Current and Future Land Use, General Site Contaminant and Media Info, Site Area and Location information.)*

The Aberdeen Contaminated Groundwater Site (ACGS or Site) is located along NC Highway 211, approximately 1½ miles east of US Highway 1 in Aberdeen, Moore County, North Carolina. The Site was listed on the NPL as a trichloroethene (TCE) groundwater plume Site with no identified source. The plume was identified during the investigations of the following sites and facilities in the area: the Geigy Chemical Corporation Superfund Site (Geigy Site), the Crestline Contaminated Well Emergency Response site (formerly known as the Route 211 Contaminated Well Site), the former Lee Paving Company property, and the former Powder Metal Products (PMP) facility. Therefore, the footprint of ACGS includes these four sites.

Current land use in the area around the ACGS is residential, industrial, and commercial in nature. This is not expected to change in the future.

The hydrogeologic framework within the ACGS study area consists of five distinct hydrogeologic units. These include from top (the surface) to bottom, the surficial aquifer, the Upper Black Creek aquifer, the Lower Black Creek aquifer, the Upper Cape Fear aquifer, and the saprolite-bedrock aquifer. To date, groundwater contamination has only been observed in the upper three aquifers. Each aquifer is separated from the overlying aquifer by a confining unit.

As stated above, several of the industrial areas within the footprint of ACGS have been investigated for environmental problems. The PMP property is a 26.8 acre parcel with one metal building on it. The building is 200 feet by 150 feet on a concrete slab. A 6-foot chain linked security fence encompasses the building along with approximately 3.8 acres. Powder Metals Products owned and operated the facility and made precision machine parts from approximately 1980 until 1995. A part of their process included a solvent dip bath containing TCE. In 1995, PMP sold the property to Diamond Exhaust & Equipment which operated the facility as a wholesale automotive exhaust parts distribution center. It is not known whether Diamond Exhaust & Equipment utilized any chemicals or solvents. This property was recently sold to CALCO Enterprises which is a small company based out of Southern Pines, North Carolina. CALCO Enterprises provides mechanical services (with a specialty in pre-insulated underground piping), process piping services, miscellaneous steel welding, and erection.

The size of the TCE plume is approximately 6,400 feet by 5,600 feet or 1.3 square miles and the TCE plume and the pesticide plume from the Geigy Chemical Superfund site have comingled. Elevated levels of TCE have been consistently detected in two water supply wells for the Town of Aberdeen municipal water system.

General Project Information

Type of Action:	(Please Select)	Site Charging SSID:	A4QHRD01
Operable Unit:	Anticipate one OU	CERCLIS Action RAT Code:	

Is this the final action for the site that will result in a site construction completion?	☐ Yes	X No
Will implementation of this action result in the Environmental Indicator for Human Exposure being brought under control?	X Yes	☐ No

Response Action Summary

Describe briefly site activities conducted in the past or currently underway:

In May 1990, EPA initiated an emergency response at the "Route 211 Contaminated Well Site". This response included connecting up to 10 private residences/businesses to the Town of Aberdeen municipal water system due to lead and TCE being present in the groundwater in this area. In 1991, this emergency response was expanded to include up to 40 residences/businesses. This Site later became known as the "Crestline Contaminated Well Site".

From 1964 until 1989, the North Carolina Department of Transportation (NCDOT) operated an aggregate testing laboratory on the Lee Paving Company property. Since 1989, a part of this property has been used for the storage and handling of recyclable wastes and the remainder of this property has remained vacant. In 1992, NCDOT and North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR) began assessments of asphaltic materials testing sites in the State. From 1994 to 1996, a NCDOT contractor conducted a site assessment of the geology and hydrogeology of the Lee Paving property. This study focused on TCE, 1,1,1-trichloroethane (TCA), carbon tetrachloride (CTC), and their degradation products. Samples collected in 1994 and 1995 documented a commingled plume of TCE and TCA in the southern portion of the Lee Paving property and migrating west in the surficial aquifer. Three monitoring wells located on the northern portion of the Lee Paving property showed contamination by TCE only. No other monitoring wells screened in the Upper Black Creek aquifer on the Lee Paving property have shown TCE contamination. Two surficial aquifer monitoring wells north of this plume were not contaminated. Therefore, EPA concluded that the TCE found in the monitoring wells in the northern portion of the Lee Paving property is part of the ACGS plume and is different from the plume detected in the southern portion of the Lee Paving property.

In an effort to identify the primary source of TCE being detected in the groundwater, North Carolina Department of Environment and Natural Resources (NCDENR) installed four nested pairs of monitoring wells around the PMP facility in 2000. The shallow wells were screened in the surficial aquifer and the deeper wells were screened in the Upper Black Creek Aquifer. These monitoring wells and others have documented TCE contamination in the western and southern areas around the PMP property. The concentrations detected indicate a higher concentration in the Upper Black Creek Aquifer than in the surficial aquifer with the highest concentration due west of the facility.

In order to better document if the PMP facility was the source for the TCE contamination, additional wells were installed and sampled April 2004. Although EPA has not named the PMP facility as the source of the groundwater contamination associated with the Aberdeen Contaminated Groundwater Site, this facility is the most likely candidate for the primary source of TCE being detected in the groundwater. The data collected during the RI did not confirm that the PMP property as the source of the TCE plume, but did not identify any other potential source of TCE.

Specifically identify the discrete activities and site areas to be considered by this panel evaluation:

The selected remedial option is Alternative 3 which involves removing contaminated groundwater using an extraction well network, the construction of a new groundwater treatment plant, and the installation of wellhead treatment on two of the Town of Aberdeen's water system supply wells. Treatment would involve activated carbon and the treated water would be discharged into a new infiltration gallery. A groundwater monitoring program would be established to evaluate the extraction and treatment systems and monitor the groundwater plumes for 30 years. Activated carbon treatment was the selected treatment technology as the extracted groundwater will also contain elevated levels of pesticides. Site activities would include the following:

- Conduct aquifer testing
- Conduct treatability study
- Implement well head treatment at two Town of Aberdeen supply wells
- Install extraction wells and distribution piping.
- Construct groundwater treatment plant.

- Construct infiltration gallery.
- Install additional monitoring wells.
- Continued monitoring of groundwater for chemical parameters.
- Five Year Reviews

Briefly describe additional work remaining at the site for construction completion after completion of discrete activities being ranked:

Complete the delineation of the TCE plume in the Lower Black Creek Aquifer. Issue a final ROD and implement any additional work associated with the Final ROD.

Response Action Cost

Total Cost of Proposed Response Action:

($ amount should represent total funding need for new RA funding from national allowance above and beyond those funds anticipated to be utilized through special accounts or State Superfund Contracts.)

Estimated Capital Cost: $3,176,400

Estimated Annual O&M Cost: $248,300

Estimated Total O&M Cost Over 30 Years: $7,449,700

Estimated Present Worth Cost (30 year timeframe): $7,260,200

Estimated Construction Timeframe: 12 months

Exemption 5 - DP

Source of Proposed Response Action Cost Amount:

(ROD, 30%, 60%, 90% RD, Contract Bid, USACE estimate, etc…)

Interim ROD

Breakout of Total Action Cost Planned Annual Need by Fiscal Year:

(If the estimated cost of the response action exceeds $10 million, please provide multiple funding scenarios for fiscal year needs; general planned annual need scenario, maximum funding scenario, and minimum funding scenario.)

FY12QTR4	$ 100,000	$20,000 to get RA Task Order going and $80,000 for IG with USACE for being the process of obtaining easements
FY13QTR1	$ 800,000	Partial funding for construction phase of RA
FY13QTR2	$ 800,000	Partial funding for construction phase of RA
FY13QTR3	$1,556,000	Complete funding for construction phase of RA
FY13QTR4	$ 250,000	O&M for FY14
FY14QTR4	$ 250,000	O&M for FY15
Etc.		

Other information or assumptions associated with cost estimates?

$80,000 for USACE assistance in obtaining necessary easements

$400,000 for easements, EPA could be dealing with a large number of property owners

Readiness Criteria
1. Date State Superfund Contract or State Cooperative Agreement will be signed (Month)?
September 2012
2. If Non-Time Critical, is State cost sharing (provide details)?
N/A
3. If Remedial Action, when will Remedial Design be 95% complete?
August/September 2012
4. When will Region be able to obligate money to the site?
September 2012
5. Estimate when on-site construction activities will begin:
December 2012
6. Has CERCLIS been updated to consistently reflect project cost/readiness information?
Yes

Site/Project Name:	Aberdeen Contaminated Groundwater Site

Criteria #1 - RISKS TO HUMAN POPULATION EXPOSED (Weight Factor = 5)

Describe the exposure scenario(s) driving the risk and remedy. Include risk and exposure information on current/future use, on-site/off-site, media, exposure route, and receptors:

A remedial action is necessary as the concentration of TCE in both the Upper and Lower Black Creek Aquifers is above the federal MCL for TCE. The exposure routes associated with use of groundwater throughout ACGS include ingestion, dermal contact while bathing/showering, and inhalation of vapors while showering. Residential groundwater usage was used as the exposure pathway and development of the exposure equations and parameters. Risk characterization considered both cancer and non-cancer health effects. Both an adult and a child resident receptor were considered for non-cancer health effects. For lifetime cancer risk, residential exposure was age-adjusted for the young child and adult because it was assumed that exposure parameters occur at the same location.

Currently, most risk is associated with future use as there are no known private potable wells being used for potable purposes in the affected area. Although TCE is being found in two supply wells for the Town of Aberdeen municipal water system, no TCE has been detected in the town's distribution system after all the water has been blended together.

Surficial Aquifer - TCE and its degradation products were not identified as COCs in the shallow groundwater because they were either not detected or they were detected at negligible concentrations. Thus, the cancer risks for the shallow groundwater were driven by non-ACGS related COCs. Three wells were evaluated in the shallow groundwater. Arsenic at well ACGMW05 resulted in the highest total cancer risk (2.7×10^{-4}). PCE at wells LPMW05S and ACGMW04 resulted in total cancer risks of 1.1×10^{-4} and 4.8×10^{-6}, respectively.

The noncancer Hazard Index (HI) at well ACGMW05 exceeded 1.0. The HI to the child resident was 44. The HI to the adult resident was 18. In both cases, ingestion of metals, primarily chromium, resulted in the highest route-specific HI (35 for the child; 15 for the adult). The dermal contact pathway also resulted in route-specific HIs greater than one.

At the current time, there is no potable use of the shallow groundwater, and no reasonable expectation of such use in the future.

Upper Black Creek Aquifer - TCE was detected in 27 of the 33 wells sampled in the Upper Black Creek Aquifer with the highest concentrations at 430 µg/l. Pesticides were detected in 16 of the 33 wells. The total cancer risks for TCE ranged from:

- Maximum TCE cancer risk: 9.8×10^{-5} (TCE concentration of 430 µg/l) at well GEIMW23D.
- Minimum TCE cancer risk: 4.3×10^{-7} (TCE concentration of 1.9 µg/l) at well LPMW07L.
- No wells with TCE had a cancer risk greater than 1×10^{-4}: none.
- The ingestion pathway resulted in the highest risk in all cases.
- Noncancer HIs were not calculated for TCE due to a lack of noncancer toxicity values.
- Pesticides resulted in cancer risks greater than 1×10^{-4} at the following wells: ACGMW12 (*alpha*-BHC), ACGMW13 (*alpha*-BHC), GEIMW11D (*beta*-BHC, dieldrin, and toxaphene), GEIMW18D (*beta*-BHC), GEIMW24D (*alpha*-BHC), and GEIMW30D (*beta*-BHC, dieldrin, and toxaphene).
- Metals resulted in noncancer Hazard Index (HI) greater than one at wells ACGMW14 and ACGMW18. In both cases, total chromium was the major contributor.

Lower Black Creek Aquifer - TCE was detected in 8 (including two municipal supply wells) of the 14 wells sampled in the Lower Black Creek Aquifer with the highest concentrations at 62 µg/l. Pesticides were detected in 6 of the 14 wells. The total cancer risks for TCE ranged from:

- Maximum TCE cancer risk: 1.4×10^{-5} (TCE concentration of 38 µg/l) at well ACGMW-12.
- Minimum TCE cancer risk: 7.0×10^{-7} (TCE concentration of 3.1 µg/l) at Aberdeen supply well TOA-9.
- No wells with TCE had a cancer risk greater than 1×10^{-4}: none.
- The ingestion pathway resulted in the highest risk in all cases.
- Noncancer HIs were not calculated for TCE due to a lack of noncancer toxicity values.
- Pesticides resulted in cancer risks greater than 1×10^{-4} at the following wells: ACGMW17 (*alpha*-BHC), GEIMW25L (*alpha*-BHC), and GEIMW27L (*alpha*-BHC and *beta*-BHC).
- Metals resulted in noncancer HIs greater than one at well ACGMW20.
- Lead was identified as a COC at wells ACGMW20 and TOA-8.

Estimate the number of people reasonably anticipated to be exposed in the absence of any future EPA action for each medium for the following time frames:

MEDIUM	<2yrs	<10yrs	>10yrs
Groundwater	480-575	600-800	>800

Discuss the likelihood that the above exposures will occur:

Currently, there are no known private wells in the affected area being used for potable purposes. The Town of Aberdeen municipal water supply system is available to all properties in the area. However, elevated concentrations of TCE are being detected in two of the Town's supply wells but due to blending with water supplied by the other supply wells, no TCE is being detected in the Town's distribution system.

Due to depth to groundwater, soil vapor intrusion is not considered a complete exposure pathway.

Other Risk/Exposure Information?

The metals detected in the groundwater are likely a result of a combination of naturally occurring conditions and an anthropogenic source. This is supported by the fact that any particular metal was not detected consistently in a well and there were a number of "clean" wells in between the PMP property and the wells that had sporadic hits of metals.

Site/Project Name:	Aberdeen Contaminated Groundwater Site

Criteria #2 – SITE/CONTAMINANT STABILITY (Weight Factor = 5)

Describe the means/likelihood that contamination could impact other areas/media given current containment:

Groundwater is migrating towards its discharge point which is Aberdeen Creek. It appears that there is not a TCE source continuing to discharge to the plume. Based on 3 years of groundwater data, it appears the TCE plume is stable.

Are the contaminants contained in engineered structure(s) that currently prevents migration of contaminants? Is this structure sound and likely to maintain its integrity?

There is no engineered structure to either contain or minimize migration of the TCE.

Are the contaminants in a physical form that limits the potential to migrate from the site? Is this physical condition reversible or permanent?

The TCE is migrating with the groundwater.

Are there institutional physical controls that currently prevent exposure to contamination? How reliable is it estimated to be?

No

Other information on site/contaminant stability?

Based on 3 years of analytical data for TCE, it appears the plume is stable, overall.

Site/Project Name:	Aberdeen Contaminated Groundwater Site

Criteria #3 – CONTAMINANT CHARACTERISTICS (Weight Factor = 3)

(Concentration, toxicity, and volume or area contaminated above health based levels)

List Principle Contaminants (Please provide average and high concentrations.):

(Provide upper end concentration (e.g. 95% upper confidence level for the mean, as is used in a risk assessment, or maximum value [assuming it is not a true outlier], along with a measure of how values are distributed {e.g. standard deviation} or a central tendency values [e.g., average].)

Contaminant	***Media**	****Concentrations**
TCE	GW - Upper Black Creek Aquifer	ND – 430 µg/l
TCE	GW - Lower Black Creek Aquifer	ND – 62 µg/l

*(*Media: AR – Air, SL – Soil, ST – Sediment, GW – Groundwater, SW – Surface Water)*

*(**Concentrations: Provide concentration measure used in the risk assessment and Record of Decision as the basis for the remedy.)*

Describe the characteristics of the contaminant with regards to its inherent toxicity and the significance of the concentrations and amount of the contaminant to site risk. *(Please include the clean up level of the contaminants discussed.)*

TCE is characterized as "carcinogenic to humans" by all routes of exposure.

Based on rough calculations, the plume in the Upper Black Creek Aquifer contains approximately 1,110 pounds of TCE and the Lower Black Creek Aquifer contains approximately 140 pounds of TCE. The clean-up level will be 3 µg/l which comes from North Carolina Administrative Code (NCAC) Title 15A Subchapter 2L - Groundwater Classifications and Standards.

Describe any additional information on contaminant concentrations which could provide a better context for the distribution, amount, and/or extent of site contamination. *(e.g. frequency of detection/outlier concentrations, exposure point concentrations, maximum or average concentration values, etc.....)*

Upper Black Creek Aquifer - TCE was detected in 27 of the 33 wells sampled in the Upper Black Creek Aquifer with the highest concentrations at 430 µg/l.

TCE was detected in 8 (including two municipal supply wells) of the 14 wells sampled in the Lower Black Creek Aquifer with the highest concentrations at 62 µg/l.

Other information on contaminant characteristics?

Very limited to no natural degradation by-products are being detected.

Site/Project Name:	Aberdeen Contaminated Groundwater Site
Criteria #4 – THREAT TO SIGNIFICANT ENVIRONMENT (Weight Factor = 3) *(Endangered species or their critical habitats, sensitive environmental areas.)*	
Describe any observed or predicted adverse impacts on ecological receptors including their ecological significance, the likelihood of impacts occurring, and the estimated size of impacted area:	
No ecological risks were identified.	
Would natural recovery occur if no action was taken? ☐ Yes ☐ No If yes, estimate how long this would take.	
Other information on threat to significant environment?	

Site/Project Name:	Aberdeen Contaminated Groundwater Site
Criteria #5 – PROGRAMMATIC CONSIDERATIONS (Weight Factor = 4) *(Innovative technologies, state/community acceptance, environmental justice, redevelopment, construction completion, economic redevelopment.)*	
Describe the degree to which the community accepts the response action.	
The community appears on board with the selected remedy.	
Describe the degree to which the State accepts the response action.	
The State appears on board with the selected remedy.	
Describe other programmatic considerations, e.g.; natural resource damage claim pending, Brownfields site, use of innovative technology, construction completion, economic redevelopment, environmental justice, etc…	
None	